

SAUERKRAUT CREEK PHASE 2 RESTORATION PROJECT

FINAL DESIGN DRAWINGS

PROJECT PARTNERS



USDA FOREST SERVICE
LINCOLN RANGER DISTRICT
1569 HIGHWAY 200
LINCOLN, MONTANA 59639



BIG BLACKFOOT CHAPTER OF TROUT
UNLIMITED
P.O. BOX 1
OVANDO, MONTANA 59854-0001



WESTWATER CONSULTANTS, INC.
1112 CATHERINE LANE
CORVALLIS, MONTANA 59828



GEUM ENVIRONMENTAL CONSULTING, INC.
307 STATE STREET
HAMILTON, MONTANA 59870

PROJECT DESCRIPTION

FOR THE PAST SEVERAL YEARS, BIG BLACKFOOT CHAPTER OF TROUT UNLIMITED (B8CTU) AND THE U.S. FOREST SERVICE HELENA NATIONAL FOREST HAVE BEEN COLLABORATING WITH MANY PARTNERS TO DEVELOP AND IMPLEMENT RESTORATION PROJECTS ON SAUERKRAUT CREEK. LOCATED IN THE UPPER BLACKFOOT RIVER WATERSHED NEAR THE TOWN OF LINCOLN, MONTANA, SAUERKRAUT CREEK SUPPORTS MIGRATORY POPULATIONS OF GENETICALLY PURE WESTSLOPE CUTTHROAT TROUT AND PROVIDES REARING HABITAT FOR BULL TROUT. MINING ACTIVITIES DATING BACK TO THE LATE 1800S REWORKED THE GLACIAL AND FLUVIAL SEDIMENTS COMPRISING THE VALLEY BOTTOM, IMPACTING AQUATIC HABITAT CONDITIONS AND RESULTING IN SIGNIFICANT IMPAIRMENT TO CHANNEL AND FLOODPLAIN PROCESSES IN SEVERAL STREAM REACHES IN THE WATERSHED. IN THESE REACHES, ALLUVIAL GRAVELS AND COBBLES WERE WORKED INTO TAILINGS PILES AND THE CHANNEL WAS RELOCATED, CHANNELIZED, AND STRAIGHTENED. THESE ACTIVITIES COMPROMISED THE INTEGRITY OF THE FLUVIAL SYSTEM BY SIMPLIFYING AQUATIC HABITAT CONDITIONS, INCREASING STREAM ENERGY, AND REDUCING OR ALTOGETHER ELIMINATING FLOODPLAIN CONNECTION AND RIPARIAN FUNCTIONS.

IN JANUARY 2013, A TECHNICAL MEMORANDUM AND PLAN SET WERE PREPARED DESCRIBING FOUR POTENTIAL RESTORATION ALTERNATIVES. BBCTU, THE USFS, AND LOCAL STAKEHOLDERS REVIEWED THE RANGE OF ALTERNATIVES AND DIRECTED THE DESIGN TEAM TO PREPARE A FINAL DESIGN FOR ALTERNATIVE 2. ALTERNATIVE 2 WILL INVOLVE RELOCATING AND RECONSTRUCTING APPROXIMATELY 770 FEET OF SAUERKRAUT CREEK UPSTREAM OF THE CHINESE WALL. THE VALLEY WILL BE REGRADED TO ESTABLISH A FUNCTIONING FLOODPLAIN. FLOODPLAIN TREATMENTS WILL INCLUDE TOPSOIL, MICRO-TOPOGRAPHY, WOODY DEBRIS, VEGETATION TRANSPLANTS, CONTAINERIZED SHRUBS AND TREES, AND NATIVE GRASSES AND FORBS. THE CHANNEL WILL BE CHARACTERIZED BY A STEEP, MODERATELY ENTRENCHED STREAM TYPE WITH STEP-POOL AND RIFFLE-POOL MORPHOLOGY. NO MODIFICATIONS TO THE CHINESE WALL WILL OCCUR UNDER ALTERNATIVE 2.

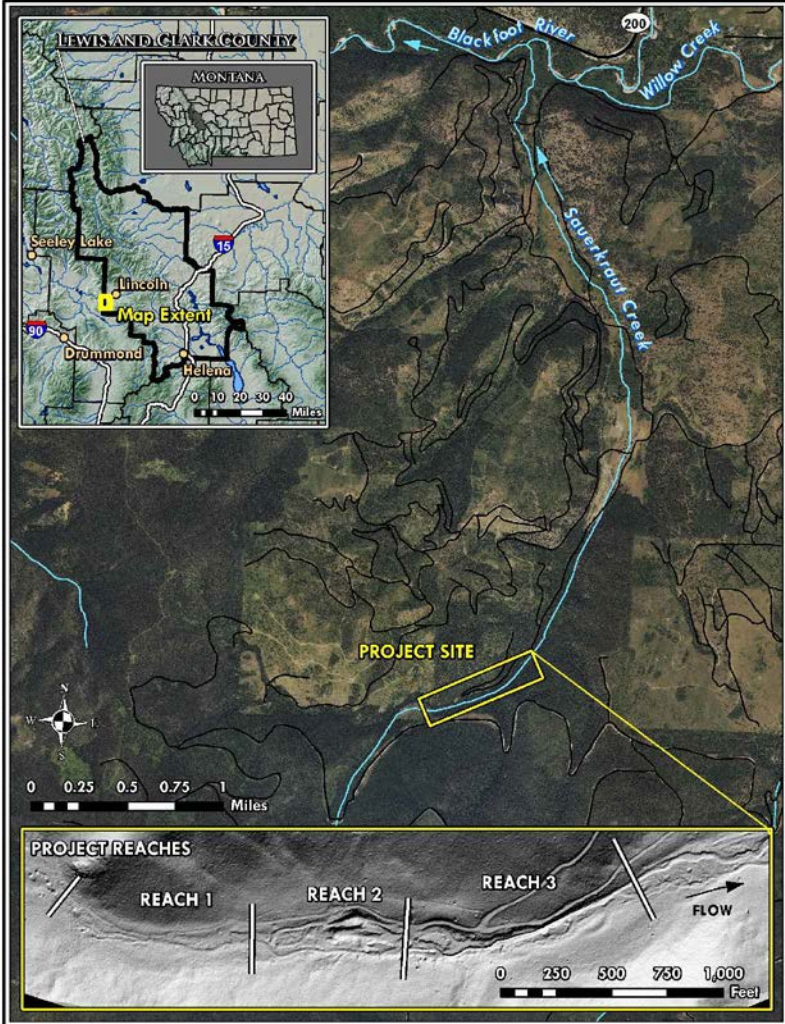
GENERAL NOTES

1. CONTOUR INTERVAL IS NOTED ON DRAWINGS.
2. SLOPES DESIGNATED AS 2:1, 1.5:1, ET CETERA, ARE THE RATIOS OF HORIZONTAL DISTANCE TO VERTICAL DISTANCE.
3. DIMENSIONS ARE GIVEN IN FEET AND TENTHS OF A FOOT.
4. TOPOGRAPHY AND CROSS SECTION GROUND LINES ARE BASED ON SURVEY WORK PERFORMED FROM JULY TO SEPTEMBER 2013 AND 2012 LIDAR DATA WAS CREATED IN OCTOBER 2011 AND PROVIDED BY TROUT UNLIMITED. ALL LIDAR DATA WAS COORDINATED BY RDG.
5. ALL EXISTING CONDITIONS ARE TO BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION AND ANY ADJUSTMENTS TO THE DRAWINGS SHALL BE MADE AS DIRECTED BY THE ENGINEER.
6. EXISTING PRIVATE IMPROVEMENTS, WHICH LIE WITHIN THE CONSTRUCTION LIMITS, UNLESS OTHERWISE NOTED WILL BE REMOVED BY THE OWNER PRIOR TO CONSTRUCTION, OR ABANDONED IN PLACE.
7. PROTECT ALL TREES AND LAND AREAS NOT LOCATED WITHIN THE PROJECT CONSTRUCTION, STAGING OR EARTHWORK LIMITS. EXERCISE CARE IN AREAS NOT SO MARKED TO AVOID UNNECESSARY DAMAGE TO NATURAL VEGETATION.
8. THE PROJECT SPONSOR IS RESPONSIBLE FOR COMPLYING WITH ALL PERMITS AND EASEMENTS INCLUDING ALL FEDERAL, STATE, COUNTY, AND LOCAL PERMIT CONDITIONS.
9. EXCAVATION, TRENCHING, SHORING, AND SHIELDING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING THE WORK, THESE DRAWINGS ARE NOT INTENDED TO PROVIDE MEANS OR METHODS OF CONSTRUCTION.
10. EXCAVATION SHALL MEET THE REQUIREMENTS OF OSHA 29 CFR PART 1926, SUBPART P, EXCAVATIONS. ACTUAL SLOPES SHALL NOT EXCEED THE SLOPES AS INDICATED ON DRAWINGS.
11. ENGINEER WILL PROVIDE SURVEY CONTROL AND GRADING SURFACES FOR EQUIPMENT WITH GPS MACHINE CONTROL CAPABILITY. CONTRACTOR SHALL PROVIDE SURVEY STAKING AND LAYOUT FOR CONSTRUCTION.
12. VERTICAL TOLERANCE FOR CONSTRUCTION COMPLIANCE WILL BE 0.3 FEET. HORIZONTAL TOLERANCE WILL BE 1.0 FEET.
13. CONTRACTOR SHALL CONFIRM QUANTITIES. REPORTED VOLUMES ARE NEATLINE AND DO NOT INCLUDE ADJUSTMENTS FOR COMPACTION OR OTHER FACTORS.

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SAUERKRAUT VICINITY MAP



LEGAL DESCRIPTION

SE1/4 OF SE1/4 OF SECTION 7, SW1/4 OF SECTION 8, TOWNSHIP 13N, RANGE 9W

STANDARD OF PRACTICE

RIVER DESIGN GROUP, INC. WORKS EXCLUSIVELY IN THE RIVER ENVIRONMENT AND UTILIZES THE MOST CURRENT AND ACCEPTED PRACTICES AVAILABLE FOR PLANNING AND DESIGN OF ECOLOGICAL RESTORATION AND HABITAT ENHANCEMENT PROJECTS. CURRENT STANDARDS FOR THE DESIGN OF RESTORATION PROJECTS VARY DEPENDING ON PROJECT GOALS. WHEN IN-STREAM STRUCTURES ARE PRIMARILY INSTALLED FOR HABITAT, STABILITY OF THE STRUCTURES IS USUALLY EVALUATED AT A 25-YEAR FLOW (4 PERCENT EXCEEDANCE) EVENT. WHEN STRUCTURES ARE INSTALLED FOR BANK STABILITY OR AROUND INFRASTRUCTURE, THE STABILITY OF THE STRUCTURES IS USUALLY EVALUATED AT A 100-YEAR FLOW (1 PERCENT EXCEEDIN) EVENT.



Whitefish, MT 59937
tel. 406.862.4927
fax. 406.862.4963

Corvallis, OR 97333
tel. 541.738.2920
fax. 541.758.8524

COVER PAGE

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IMAGE: ESRI WORLD IMAGE 2011

EXISTING CONDITIONS

THE CHANNEL AND VALLEY MORPHOLOGY IN THE PROJECT AREA HAVE BEEN HIGHLY MODIFIED BY PAST MINING ACTIVITIES. TO ACCOMMODATE PLACER MINING, THE CHANNEL WAS RELOCATED TO THE TOE OF THE HILLSLOPE ON THE SOUTHEAST SIDE OF THE VALLEY. THE CURRENT MORPHOLOGY IS CHARACTERIZED BY LONG, EXTENDED RIFFLES AND COBBLE SUBSTRATE (B3 STREAM TYPE). LARGE WOOD AND POOLS ARE LACKING. IN LOCATIONS, EXISTING MINE WASTE PILES CONFINE THE CHANNEL RESULTING IN ENTRENCHED CHANNEL CONDITIONS. A NARROW FRINGE OF WOODY VEGETATION, DOMINATED BY ALDER IS PRESENT ALONG THE CHANNEL AND REMNANT RIPARIAN VEGETATION SUCH AS ALDERS, WILLOWS, ASPENS AND SPRUCE ARE PRESENT IN THE VALLEY BOTTOM NEAR THE UPSTREAM END OF THE PROJECT AREA. SIGNIFICANT MINING AND EXCAVATION OF ALLUVIAL SEDIMENTS OCCURRED IN THE PROJECT AREA FORMING A LARGE TOPOGRAPHIC DEPRESSION IN THE VALLEY FLOOR. IN AREAS, THE CHANNEL IS APPROXIMATELY 20 FEET HIGHER IN ELEVATION THAN THE TOPOGRAPHIC LOW POINT OF THE VALLEY. THE VEGETATION IN THE TOPOGRAPHIC DEPRESSION CONSISTS OF DOGWOODS, ALDERS, WILLOWS, ASPENS AND SPRUCE INDICATING THIS AREA IS CONSISTENTLY WET AND MAY INDICATE THAT A PORTION OF THIS AREA WAS HISTORICALLY RIPARIAN FLOODPLAIN CONNECTED TO THE CHANNEL.

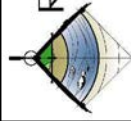
THE EXISTING PERCHED CHANNEL POSES A HIGH RISK FOR A MAJOR AVULSION THAT COULD INITIATE REACH-SCALE CHANNEL INCISION IN THE PROJECT AREA. A LARGE DEPOSIT OF SAND AT THE DOWNSTREAM END OF THE PROJECT AREA INDICATES THAT OVERBANK FLOWS FREQUENTLY MOVE THROUGH THE TOPOGRAPHIC LOW POINT OF THE VALLEY AND RE-ENTER SAUERKRAUT CREEK AT THE TOP OF THE CHINESE WALL DOWNSTREAM OF THE PROJECT AREA. IN THE LOWER END OF THE REACH, THE EXISTING CHANNEL HAS UNDERMINED THE SOUTH VALLEY HILLSLOPE CAUSING SLOPE FAILURE AND SEDIMENT DELIVERY TO THE CHANNEL.

DOWNSTREAM OF THE PROJECT AREA IS A HIGHLY ENTRENCHED REACH COMMONLY REFERRED TO AS THE CHINESE WALL. CONSTRUCTED IN THE LATE 1800S DURING THE INITIAL MINING BOOM, THE WALL WAS CONSTRUCTED TO CREATE A SLUICEWAY STREAM CHANNEL. THE SLUICEWAY WAS USED AS AN EARTHMOVING TECHNIQUE FOR DAMMING THE WATER, WHICH THEN ALLOWED FOR A RAPID RELEASE CAUSING EROSION OF THE GRAVEL BY A SYNTHETIC FLASH FLOOD EVENT. THE REACH IS HIGHLY ENTRENCHED AND VERTICALLY CONTAINED, BUT IS A CULTURALLY SIGNIFICANT RESOURCE THAT WILL BE MAINTAINED IN ITS CURRENT CONDITION. SURFACES ADJACENT TO THE CHINESE WALL ARE COMPOSED OF LARGE COBBLES AND BOULDERS AND LACK VEGETATION.

REACH 2 LIMITING FACTORS INCLUDE:

- LACK OF DEEP POOLS, COVER AND LARGE WOOD LIMIT AQUATIC HABITAT COMPLEXITY
- PERCHED CHANNEL CONDITIONS INCREASE THE RISK OF A MAJOR CHANNEL AVULSION
- PERCHED CHANNEL CONDITIONS LIKELY REDUCE THE ABILITY OF THE AQUIFER TO STORE AND RELEASE GROUNDWATER TO SAUERKRAUT CREEK DURING BASE FLOW PERIODS
- THE ALTERED VALLEY MORPHOLOGY SIGNIFICANTLY IMPAIRS NATURAL RIPARIAN AND FLOODPLAIN PROCESSES INCLUDING SEDIMENT STORAGE, NUTRIENT CYCLING, AND FLOOD ATTENUATION
- CATTLE GRAZING IS IMPACTING RIPARIAN AND FLOODPLAIN VEGETATION IN PORTIONS OF THE PROJECT AREA.

IN ADDITION TO CHANNEL AND FLOODPLAIN RESOURCE IMPAIRMENTS, AN EXISTING ROAD PARALLELS SAUERKRAUT CREEK WITHIN THE RIPARIAN ZONE AND CURRENTLY LACKS SURFACE DRAINAGE AND BEST MANAGEMENT PRACTICES. VEHICLE TRAFFIC AT AN EXISTING FORD HAS DAMAGED AND LOWERED STREAMBANKS, RESULTING IN ALTERED CHANNEL MORPHOLOGY AND SEDIMENT DEPOSITION. LIVESTOCK GRAZING IN LOCALIZED AREAS HAS IMPACTED STREAMBANK AND FLOODPLAIN VEGETATION PARTICULARLY IN AREAS WHERE LIVESTOCK HAVE DIRECT ACCESS TO THE CHANNEL. IN THESE ISOLATED AREAS, STREAMBANK STABILITY IS POOR AND BANK EROSION IS OCCURRING.

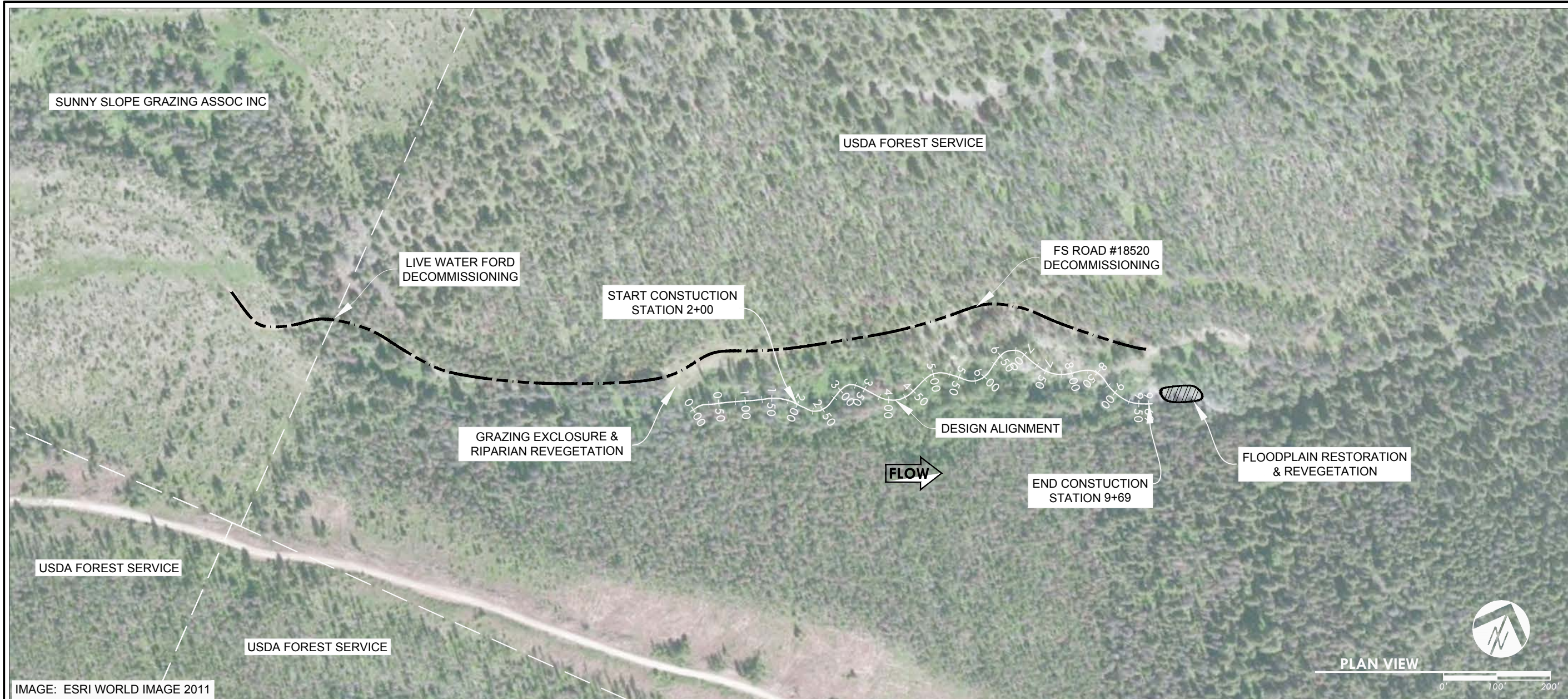


5098 Hwy 93 South
Whitefish, MT 59937
Tel: 406.862.4927
Fax: 406.862.4963

311 SW Jefferson Avenue
Corvallis, OR 97333
Tel: 541.738.9920
Fax: 541.738.8524

EXISTING CONDITIONS

NO.	DATE	BY	DESCRIPTION	CHK					
					JM				
1	02-15-14	NW	FINAL DESIGN						
PROJECT NUMBER					RDG-14-002				
SHEET NUMBER					2.0				





PLAN VIEW INDEX

NO.	DATE	BY	DESCRIPTION	CHK
1	03-15-14	NW	FINAL DESIGN	JM
PROJECT NUMBER				
RDG-14-002				
SHEET NUMBER				
4.0				

GENERAL SPECIFICATIONS

1. THE PROJECT SHALL BE CONSTRUCTED ACCORDING TO THE PLAN SET. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY CHANGES PRIOR TO IMPLEMENTATION. THE CONSTRUCTION MANAGER FOR THIS PROJECT SHALL BE A DESIGNATED RIVER DESIGN GROUP REPRESENTATIVE.

2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. CALL U-DIG PRIOR TO CONSTRUCTION.

3. COSTS INCURRED DUE TO PROJECT DELAYS RESULTING FROM FAILURE OF THE CONTRACTOR TO MEET THE REQUIREMENTS OF THE GENERAL SPECIFICATIONS, CONTRACTOR QUALIFICATIONS, CONSTRUCTION SPECIFICATIONS, MATERIALS SPECIFICATIONS AND REVEGETATION SPECIFICATIONS SHALL BE THE EXPENSE OF THE CONTRACTOR.

CONTRACTOR QUALIFICATIONS

1. THE CONTRACTOR SHALL HAVE AT LEAST TWO (2) YEARS OF RIVER RESTORATION CONSTRUCTION EXPERIENCE AND SHALL HAVE COMPLETED AT LEAST FIVE (5) RIVER RESTORATION PROJECTS. OR, THE CONTRACTOR SHALL HAVE AT LEAST ONE (1) YEAR OF RIVER RESTORATION EXPERIENCE, SHALL HAVE COMPLETED AT LEAST THREE (3) RIVER RESTORATION PROJECTS, AND SHALL HAVE COMPLETED AN APPROVED RIVER RESTORATION TRAINING CLASS. APPROVED TRAINING CLASSES INCLUDE THOSE SPONSORED BY WILDLAND HYDROLOGY, INC., OR A SIMILARLY QUALIFIED PRACTITIONER OF NATURAL CHANNEL DESIGN STREAM RESTORATION PRINCIPLES.

2. IF THE CONTRACTOR CHOOSES TO DESIGNATE AN EMPLOYEE WITHOUT QUALIFIED STREAM RESTORATION EXPERIENCE, THE CONTRACTOR SHALL BE ON-SITE AT ALL TIMES WHEN THE EMPLOYEE IS PERFORMING RIVER RESTORATION WORK. FAILURE TO ABIDE BY THIS CONDITION WITHOUT PREVIOUS AGREEMENT WITH THE CONSTRUCTION MANAGER WOULD BE GROUNDS FOR TERMINATION.

3. THE CONTRACTOR SHALL MAINTAIN AT LEAST \$2,000,000 IN LIABILITY INSURANCE AND HAVE PROOF OF LIABILITY INSURANCE ON-SITE DURING THE ENTIRETY OF PROJECT CONSTRUCTION.

4. THE CONTRACTOR SHALL HAVE PROOF OF WORKER'S COMPENSATION INSURANCE ON-SITE DURING THE ENTIRETY OF PROJECT CONSTRUCTION.

5. COPIES OF ALL PROJECT PERMITS SHALL BE POSTED ON-SITE IN A VISIBLE LOCATION. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF THE PERMITS. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY KNOWN CHANGES OR ACTIVITIES THAT COULD VIOLATE PERMIT REQUIREMENTS PRIOR TO IMPLEMENTATION. THE CONSTRUCTION MANAGER SHALL BE RESPONSIBLE FOR ALL CORRESPONDENCE WITH PERMIT AGENCIES.

TEMPORARY DIVERSION PROCEDURES

1. MFWP SHALL BE NOTIFIED AT LEAST 72 HOURS PRIOR TO ACTIVATION OR DEACTIVATION OF ALL TEMPORARY BYPASS CHANNELS. THE PHONE NUMBER FOR RON PIERCE AT THE MFWP OFFICE IS 406-542-5532. MFWP SHALL DETERMINE IF IT IS NECESSARY TO CONDUCT A FISH RESCUE.

2. TEMPORARY DIVERSIONS SHALL BE ACTIVATED OR DEACTIVATED INCREMENTALLY IN THREE EQUAL STAGES TO ALLOW RESIDENT AQUATIC LIFE TO EXIT THE DEWATERED AREA.

3. A PERIOD OF APPROXIMATELY ONE HOUR SHALL BE ALLOWED BETWEEN THE FIRST TWO STAGES.

4. A PERIOD OF APPROXIMATELY 12 HOURS SHALL BE ALLOWED BEFORE THE FINAL STAGE. MFWP SHALL CONDUCT FISH RESCUES DURING THE 12 HOUR PERIOD.

5. UPON NOTIFICATION FROM MFWP, THE REMAINING FLOW SHALL BE DIVERTED.

6. EFFORTS SHALL BE MADE TO LIMIT TURBIDITY DURING DIVERSION ACTIVATION AND DEACTIVATION. MATERIAL USED TO DIVERT FLOW DURING STAGED DIVERSIONS SHALL BE CLEAN AND DEVOID OF FINES.

7. EFFORTS SHALL BE MADE TO LIMIT DISTURBANCE TO VEGETATION.

8. EFFORTS SHALL BE MADE TO AVOID FATALITIES OF AQUATIC LIFE.

MATERIALS SPECIFICATIONS

1. THE CONTRACTOR SHALL FURNISH ALL MATERIALS NECESSARY TO CONSTRUCT THE PROJECT. THE CONTRACTOR SHALL DELIVER ALL MATERIALS TO THE DESIGNATED STOCKPILE LOCATIONS LABELED ON THE PLAN SET OR TO A LOCATION SPECIFIED BY THE CONSTRUCTION MANAGER. IF A MATERIAL SOURCE HAS BEEN PRE-DETERMINED, THE CONSTRUCTION MANAGER SHALL PROVIDE DIRECTIONS TO THE CONTRACTOR.

2. MATERIAL QUANTITIES, DIMENSIONS AND SIZES SHALL CONFORM TO THE NOTES AND SPECIFICATIONS PROVIDED ON THE PLAN SET OR ON THE MATERIALS LIST.

3. THE CONSTRUCTION MANAGER SHALL INSPECT AND APPROVE ALL MATERIALS PRIOR TO CONSTRUCTION. IF MATERIALS DO NOT MEET THE MINIMUM REQUIREMENTS SPECIFIED IN THE PLAN SET OR MATERIAL LIST, THE CONSTRUCTION MANAGER SHALL REJECT THE MATERIALS.

EQUIPMENT SPECIFICATIONS

1. THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT NECESSARY TO CONSTRUCT THE PROJECT. THE CONTRACTOR SHALL MOBILIZE ALL EQUIPMENT TO THE PROJECT AREA AS DIRECTED BY THE CONSTRUCTION MANAGER.

2. AT A MINIMUM, THE CONTRACTOR SHALL PROVIDE THE FOLLOWING EQUIPMENT FOR THIS PROJECT:

EXCAVATOR - TWO (2) EXCAVATOR(S) SHALL BE REQUIRED. THE EQUIPMENT SHALL BE MINIMUM 200 CLASS AND EQUIPPED WITH MACHINE GRADE GPS. THE BUCKET VOLUME SHALL BE ONE (1) CUBIC YARD(S). THE BUCKET SHALL BE EQUIPPED WITH A HYDRAULIC THUMB FOR GRASPING LOGS, ROCKS, AND OTHER MATERIALS. THE EQUIPMENT MUST BE CAPABLE OF CROSSING WATER AND WORKING ON OR ADJACENT TO STEEP SLOPES. A CHAIN SHALL BE AVAILABLE FOR ATTACHING CULVERTS, PUMPS AND OTHER EQUIPMENT OR MATERIALS TO THE BUCKET FOR TRANSPORT ON-SITE.

DUMP TRUCK - TWO (2) TRACKED DUMP TRUCK(S) SHALL BE REQUIRED FOR THIS PROJECT. TRUCK(S) SHALL HAVE A MINIMUM BED VOLUME OF TEN (10) CUBIC YARDS. THE TRUCK(S) SHALL BE TRACKED AND CAPABLE OF DRIVING ON NON-ASPHALT SURFACES AND OFF-ROAD SURFACES.

BULL DOZER - ONE (1) BULL DOZER SHALL BE REQUIRED FOR THIS PROJECT. THE EQUIPMENT SHALL BE A MINIMUM OF CAT D6 OR EQUIVALENT. BULL DOZER SHALL BE EQUIPPED WITH MACHINE GRADE GPS.

ALL SURFACE VEHICLE - ONE (1) ALL-SURFACE VEHICLE (ASV) SHALL BE REQUIRED. THE EQUIPMENT SHALL BE EQUIPPED WITH SOD TRACKS TO MINIMIZE DISTURBANCE TO FRAGILE AREAS. ONE TREE SPADE SHALL BE PROVIDED AND BE OF SUFFICIENT SIZE TO TRANSPLANT LARGE, MATURE WILLOWS. A HARROW RAKE OR SIMILAR ATTACHMENT SHALL BE AVAILABLE TO RIP COMPACTED SURFACES AND TEMPORARY CONSTRUCTION ACCESS ROADS AT THE TERMINATION OF THE PROJECT.

CHAINSAW - TWO (2) CHAINSAW SHALL BE REQUIRED. THE CHAINSAW MUST BE CAPABLE OF COMPLETELY SAWING LOGS OF THE DIAMETER SPECIFIED IN THE MATERIAL SPECIFICATIONS. ALSO, THE CHAINSAW MUST BE CAPABLE OF SAWING HDPE OR PVC CULVERTS OR PIPES AS NOTED IN THE MATERIAL SPECIFICATIONS.

3. ALL EQUIPMENT SHALL BE WASHED PRIOR TO MOBILIZATION TO THE SITE TO MINIMIZE THE INTRODUCTION OF FOREIGN MATERIALS AND FLUIDS TO THE PROJECT SITE. ALL EQUIPMENT SHALL BE FREE OF OIL, HYDRAULIC FLUID, AND DIESEL FUEL LEAKS. TO PREVENT INVASION OF NOXIOUS WEEDS OR THE SPREAD OF WHIRLING DISEASE SPORES, ALL EQUIPMENT SHALL BE POWER WASHED OR CLEANED TO REMOVE MUD AND SOIL PRIOR TO MOBILIZATION INTO THE PROJECT AREA. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ADEQUATE MEASURES HAVE BEEN TAKEN.

4. EQUIPMENT SHALL BE IN A WELL-MAINTAINED CONDITION TO MINIMIZE THE LIKELIHOOD OF A FLUID LEAK. IF A FLUID LEAK DOES OCCUR, THE CONSTRUCTION MANAGER SHALL BE NOTIFIED IMMEDIATELY, AND ALL WORK CEASED UNTIL THE LEAK HAS BEEN RECTIFIED. AT ALL TIMES DURING THE CONSTRUCTION PHASE, FLUID SPILL CONTAINMENT EQUIPMENT SHALL BE PRESENT ON-SITE AND READY FOR DEPLOYMENT SHOULD AN ACCIDENTAL SPILL OCCUR.

5. THE CONTRACTOR SHALL MAINTAIN A COMPLETE TOOL SET WITH COMMONLY REPLACED PARTS (E.G. O-RINGS) TO MINIMIZE DOWNTIME IN THE EVENT OF EQUIPMENT MALFUNCTION. THE CONTRACTOR SHALL HAVE AN EMERGENCY SPILL KIT ON SITE DURING THE PROJECT.

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCTION SHALL OCCUR IN ACCORDANCE WITH THE PLAN SET, CONSTRUCTION SPECIFICATIONS, EQUIPMENT SPECIFICATIONS, MATERIAL SPECIFICATIONS, REVEGETATION SPECIFICATIONS AND GENERAL SPECIFICATIONS.

2. CONSTRUCTION ACCESS SHALL BE DETERMINED BY THE CONSTRUCTION MANAGER. CONSTRUCTION EQUIPMENT SHALL NOT CROSS PRIVATE LAND UNLESS PERMISSION IS OBTAINED FROM THE LANDOWNER. THE CONTRACTOR SHALL LEAVE ALL GATES, WHETHER OPEN OR CLOSED, AS FOUND.

3. STREAM CROSSINGS SHALL BE MINIMIZED DURING CONSTRUCTION. IF MULTIPLE CROSSINGS (10 OR MORE) ARE EXPECTED, THE CONTRACTOR SHALL PROVIDE AND INSTALL 2-36 INCH TEMPORARY CULVERTS SO THAT EQUIPMENT CAN CROSS THE STREAM WITHOUT GENERATING EXCESS TURBIDITY.

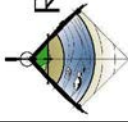
4. STRAW BALES AND SILT FENCING SHALL BE AVAILABLE AND INSTALLED BY THE CONTRACTOR IF DEEMED NECESSARY BY THE CONSTRUCTION MANAGER. CONSTRUCTION FENCING (LIMITS OF DISTURBANCE) SHALL BE INSTALLED BY THE CONTRACTOR IF DEEMED NECESSARY BY THE CONSTRUCTION MANAGER.

5. INITIALLY, THE CONTRACTOR SHALL EXCAVATE THE CHANNEL TO APPROXIMATE DESIGN DIMENSIONS USING THE EXCAVATOR. EXCAVATION SHALL COMPLY WITH CONSTRUCTION STAKES AND THE PLAN SET. EXCAVATION SHALL ESTABLISH CHANNEL ELEVATIONS WITHIN ONE-HALF FOOT OF FINAL ELEVATIONS. THE CONSTRUCTION MANAGER SHALL INSPECT THE CHANNEL EXCAVATION FOR COMPLIANCE WITH THE PLAN SET. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED ON-SITE, ABOVE THE BANKFULL CHANNEL UNTIL HAULED OFF-SITE OR USED ON-SITE. DISTURBANCE TO RIPARIAN VEGETATION, CHANNEL BANKS AND SOD SHALL BE MINIMIZED. EXCAVATED SOD AND RIPARIAN SHRUB TRANSPLANTS SHALL BE CAREFULLY STOCKPILED AND REUSED FOR PLANTING FLOODPLAINS OR STREAM BANKS.

6. AFTER EXCAVATING THE CHANNEL, THE CONTRACTOR SHALL INSTALL BANK STABILIZATION AND HABITAT STRUCTURES USING THE EXCAVATOR. EACH STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LOCATIONS AND SPECIFICATIONS PROVIDED IN THE PLAN SET. THE CONSTRUCTION MANAGER SHALL INSPECT AND APPROVE ALL STRUCTURES PRIOR TO BACKFILLING.

7. AFTER ALL STRUCTURES ARE INSTALLED, THE CHANNEL WILL BE SHAPED TO WITHIN 0.2 FEET OF THE FINAL ELEVATIONS SPECIFIED ON THE PLAN SET USING AN EXCAVATOR. THE CONSTRUCTION MANAGER SHALL CHECK THE FINAL ELEVATIONS FOR COMPLIANCE WITH THE PLAN SET. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED ON-SITE, ABOVE THE BANKFULL CHANNEL UNTIL HAULED OFF-SITE OR USED ON-SITE. DISTURBANCE TO RIPARIAN VEGETATION, CHANNEL BANKS AND SOD SHALL BE MINIMIZED.

8. THE CONTRACTOR SHALL REMOVE EXCESS MATERIALS, TEMPORARY CULVERTS AND EQUIPMENT FROM THE SITE. THE CONTRACTOR SHALL REGRADE DISTURBED AREAS AND CONSTRUCTION ACCESS ROADS TO THEIR ORIGINAL GRADES. THE CONTRACTOR SHALL TREAT COMPACTED SOIL AREAS INCLUDING ACCESS ROADS AND MATERIAL STOCKPILE AREAS. THE CONTRACTOR SHALL REMOVE SOIL FROM THE PROJECT SITE IF THE SOIL IS TAINTED WITH PETROLEUM-BASED FLUIDS.



RIVER DESIGN GROUP, INC.

5098 Hwy 93 South
Whitefish, MT 59937
tel: 406.862.4927
fax: 406.862.4963

311 SW Jefferson Avenue
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tel: 541.738.9920
fax: 541.738.8524

SPECIFICATIONS

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PROJECT NUMBER RDG-14-002				
SHEET NUMBER 6.0				